

**NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD**

PASTURE AND HAY PLANTING

(Acre, Hectare)

Code 512

DEFINITION

Establishing native or introduced forage species.

PURPOSES

This practice may be applied as part of a conservation management system to accomplish one or more of the following purposes:

- Establish adapted and compatible species, varieties, or cultivars to be used for pasture or for hay.
- Improve or maintain livestock nutrition and/or health.
- Extend the length of the grazing season.
- Provide emergency forage production.
- Reduce soil erosion by wind and/or water.
- Provide fodder and shelter for wildlife.

CONDITIONS WHERE PRACTICE APPLIES

This practice may be applied on rangeland and forestland where forage production is feasible and desired.

CRITERIA

General criteria applicable to all the purposes stated above. Plant species and their cultivars shall be selected based upon:

- Climatic conditions, such as annual rainfall, seasonal rainfall patterns, growing season length, humidity levels, temperature extremes and the USDA Plant Hardiness

Zones. For species selection in the Caribbean Area see Table 1.

- Soil condition and position attributes such as pH, available water holding capacity, slope steepness, aspect, drainage class, inherent fertility, salinity and alkalinity, flooding and ponding, and levels of toxic elements that may be present such as selenium and aluminum. For a general adaptation between forages, climate and soil conditions see Table 2.
- Avoid planting noxious and invasive species.
- Plant resistance to disease and insects common to the site or location.
- Plant compatibility with other forage species and their selected cultivar(s) in rate of establishment, maturity, and growth habit when seeded together as a forage mixture. For plant compatibility see Table 2.

Specified timing, seeding/plant material rates, methods of planting and date of planting shall be consistent with documented guidance cited by research institutions or agency demonstration trials for achieving satisfactory establishment. For seeding/plant material rates see Table 1.

Seeding rates will be calculated on a pure live seed (PLS) basis or percent germination.

Provide a firm, weed-free seedbed that ensures seed will contact soil moisture uniformly, facilitates seedling emergence, and provides a medium that does not restrict or allow roots to become dry.

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resources Conservation Service.

All seed and planting materials shall be labeled and meet local and federal seed quality law standards.

Legume seed shall be inoculated with the proper, viable *Rhizobium* before planting.

Additional criteria for improving or maintaining livestock nutrition and/or health.

Forage species must be capable of meeting the desired level of nutrition for the kind and class of the livestock to be fed.

Forage species selected for establishment shall fulfill a recognized dietary deficiency within the year long forage management program.

Criteria for providing emergency forage production.

Select plants that will produce forage for use during periods when other on-farm/ranch forage is unavailable to meet livestock needs.

Criteria for reducing erosion by wind and/or water.

Plants shall have the ability to provide adequate ground cover, canopy cover, root mass, and vegetal retardant to wind forces and water flows either alone or in combination with other forage species when site conditions require erosion protection.

CONSIDERATIONS

Prescribed Grazing, Brush Management, Nutrient Management, Pest Management and Grazing Land Mechanical Treatment practices may be used in combination with Pasture and Hay Planting.

Where wildlife management is an objective, the food and cover value of the planting can be enhanced by using an approved habitat evaluation procedure to aid in selecting plant species and providing for other habitat requirements necessary to achieve the objective. Use approved wildlife management evaluation procedure to aid in selecting plant species and providing for other habitat requirement necessary to achieve the objective.

Always consider reproductive and nesting time for wildlife species for land preparation.

Forage species planted in mixture should exhibit similar palatability to one another to avoid spot or selective grazing.

PLANS AND SPECIFICATIONS

Specifications for the establishment of pasture and hay plantings shall be prepared for each site or management unit according to the Criteria, Considerations, and Operations and Maintenance described in this standard, and shall be recorded on specification sheets, job sheets, in narrative statements in the conservation plan, or other acceptable documentation.

OPERATION AND MAINTENANCE

Growth of seedlings or sprigs shall be monitored for water stress (deficit or excess). Water stress may require reducing weeds, early harvest of any companion crops, irrigating when possible, or replanting failed stands, depending on the severity of drought or flooding. In general grasses require 1.5 inches (38 mm.) of water weekly for optimum performance. If is not raining irrigation is advisable.

Invasion by undesirable plants shall be controlled by cutting, using a selective herbicide, or by grazing management by manipulating livestock stocking rates, density, and duration of stay.

Insects and diseases shall be controlled when an infestation threatens stand survival. When large quantities of insects are present in the fields at planting, and their control is not feasible, increase the rate of seed (true seed not vegetative material) by 10 percent. Some times birds can also be a pest after planting true seed. For pest control refer to Conservation Practice 595 Pest management.

Land preparation: Depending on the purpose, clear the land mechanically or using heavy stocking rates. Machinery is recommended for large areas. Non-tillage or minimum tillage practices are highly recommended. To plant in rows, prepare a seedbed by plowing and harrowing. Generally two plowings followed by

two passes of harrows are satisfactory for pasture and hayland. Should liming be required, apply it before the second plowing so that it will be mixed into the soil.

Planting: Planting must be done at contour or as contour as possible for farming and during the beginning of the rainy season (June to December), or any other time if water is not a concern. Pre-emergence herbicide application is appropriate only if vegetative material as cuttings or sprigs are used. Do not apply herbicides to true seed as pre-emergent. When complete land preparation is not possible, graze the area heavily and broadcast true seed. If vegetative material is to be used in steep lands or using non-till practices, plant in holes following the specifications on the Table 1.

Planting shall be scheduled in a manner that does not interfere with reproductive and nesting period of selected species of wildlife.

Pure Live Seed (PLS) – The percentage of pure live seed is used as an indicator of seed quality. It is often used in connection with seeding rate recommendations for species, which typically have relatively low germination rates and/or frequently contain a substantial quantity of inert material. Pure live seed can be calculated if purity and germination are known.

Example – Assume a bag of seed has a purity of 95% and that the germination is 85%. PLS is determined by multiplying the purity by the germination and dividing the product by 100. In this example PLS is calculated as:

$$(95 \times 85) \div 100 = 80.75\%$$

In order to calculate the amount of seed needed per acre, the PLS recommended seeding rate should be divided by the calculated PLS percentage and multiplied by 100. If the PLS recommended seeding rate is 10 lb. of PLS/A and the calculated PLS percentage is 80.75, the amount of seed that should be planted per acre is

$$(10 \div 80.75) \times 100 = 12.4 \text{ lbs.}$$

12.4 lbs. of the material taken from the bag needs to be planted in order to achieve the 10 lbs PLS/A recommended seeding rate.

Time for establishment: Allow 4 to 5 months for establishment for all grasses or legumes before grazing or cutting. A light grazing/browsing, about 2 to 3 months after planting, may increase shoot development. Overgrazing is detrimental. Observe grazing heights. Fertilizer must be applied according to the soil test recommendations for planting and establishment. Phosphorus is the only input recommended as fertilizer during the establishment period. Phosphorus promotes the development of roots.

Table 1. Forage Species Selection and Seeding Rates in the Caribbean Area.

Common Name	Technical name	Humid Zone	Semiarid Zone	Seeding Rate (Acre)
GRASSES				
Guinea grass	<i>Urochloa maxima</i>	x	x	By seeds, 25 lbs
Star grass	<i>Cynodon nlemfuensis</i>	x	x (with irrigation)	By sprigs, 1500 lbs
Pangola grass	<i>Digitaria eriantha</i>	x	x (with irrigation)	By sprigs, 1500 lbs
Elephant/Napier (all species)	<i>Pennisetum purpureum</i>	x		By culms, 2000 lbs
Buffel grass	<i>Pennisetum ciliare</i>		x	By seed, 6 lbs
Signal grass	<i>Urochloa brizantha</i>	x	x (with irrigation)	By sprigs, 1500 lbs
Para grass (Malojillo)	<i>Urochloa mutica</i>	x		By sprigs, 1500 lbs
Carib grass (Malojilla)	<i>Eriochloa polystachya</i>	x		By sprigs, 1500 lbs
Angleton (Pajón mejorado)	<i>Dichanthium annulatum</i>		x	By seeds, ____ lbs
LEGUMES				
Desmanto	<i>Desmanthus virgatus</i>		x	
Habichuela parada	<i>Macrotilium lathyroides</i>	x	X	
Pega pega	<i>Desmodium spp.</i>	x		
Siratro	<i>Macroptilium atropurpureum</i>	x	x	
Zarcilla, Tan tan	<i>Leucaena leucocephala</i> (improved varieties)		x	

Table 2. Forage species compatibility.¹

LEGUMES GRASSES					
	<i>Desmodium</i> spp. (Pega pega)	<i>Desmanthus virgatus</i> (Desmanto)	<i>Leucaena leucocephala</i> (Zarcilla)	<i>Macroptilium atropurpureum</i> (Siratro)	<i>Macroptilium lathyroides</i> (Habicueta parada)
Angleton/Pajón mejorado	x	x	x	x	x
Buffel grass	x	x	x		x
Elephant grass/Napier		x	x	x	
Guinea grass		x	x	x	
Pangola grass	x	x	x	x	x
Signal grass	x	x	x	x	x
Star grass	x	x	x	x	x

¹ X means that species can be planted in common.